REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

Upon entry of this amendment, claims 1-20, as amended, will remain in the application. No new matter has been added. Applicant submits that the amendments were previously considered, and do not require additional search or substantive reconsideration.

Section 112 rejections

Claims 1 and 10 were rejected under 35 U.S.C. 112, first paragraph, as allegedly containing subject matter which not adequately described in the specification.

The action correctly state that the remote user's computer decompressed the displayed image for viewing, and the user selects a portion of the decompressed image. The claims have been amended to clarify this.

Section 103 rejections

Claims 1-4, 6-11, 13-17, 19 and 20 were rejected as allegedly being unpatentable over Wood et al. (US 5,851,186, hereinafter "Wood") and Sivan et al. (US 6281874 B1, hereinafter "Sivan").

Applicant teaches a technique for performing image analysis on an image, e.g., scoring a medical image. Applicant's technique provides advantages of transmitting compressed images in a network environment without compromising accuracy in the image analysis.

Medical images may include a large amount of data. Transmitting such images over a network connection may increase

network traffic and increase the time in which a remote user can access the images. Compressed medical images contain less data, and may be better suited for transmission in a network environment. The compressed medical image may then be decompressed and displayed at a remote station for viewing by a medical professional. Many compression techniques, e.g., JPEG (Joint Photographic Experts Group), utilize lossy compression algorithms which cause data losses in the decompressed (i.e., restored) image. These data losses may not be noticeable to a human observer. However, such data losses may affect image analysis operations performed on the decompressed image which are more data sensitive than human visions systems. Thus, compression may reduce the accuracy and efficiency of image analysis operations.

Applicant's technique provides the networking advantages of image compression while retaining accuracy in the image analysis operation by allowing the human user to work on the compressed and subsequently decompressed image, with its unnoticeable losses, and performing the more data sensitive image analysis operation on the more accurate uncompressed ("raw") image stored at the image source, e.g., a network server.

Wood discloses an imaging system which makes ultrasonic images accessible over a network. Wood discloses sending compressed reference images over the network, but all full-size images, i.e., those used for human analysis, are transmitting over the network in an uncompressed form. Wood does not disclose performing any image analysis operations on either the compressed or uncompressed ultrasonic images.

Sivan discloses a technique for downloading graphic images in a network. A high resolution image is stored at a network server and a lower resolution image derived from the high resolution image is compressed and transmitted to a remote

station for viewing. A user may select a portion of the displayed low resolution image to be enlarged ("zoomed"). An image processing operation is performed on the high resolution image at the server to produce a modified low resolution image which is then compressed and sent to the remote station.

Siva deals with losses due to conversion from a high resolution image (i.e., an image with a high pixels-per-image ratio) to a low resolution image, and is not concerned with losses due to compression. Furthermore, Siva discloses performing image processing on a user selected portion of the high resolution image, and not image analysis. In image processing, an image is operated on to produce a new, derivative image (e.g., an enlarged portion of the image). In image analysis, certain characteristics of an image are operated on to produce a value, e.g., a score for a region of a medical image, but the image itself is not altered.

Unlike Siva, Applicant's technique deals with losses due to compression. The uncompressed image at the source and the decompressed image at the remote station may have the same resolution. Also, Applicant's technique performs an image analysis operation on a user selected portion of the uncompressed image, and returns a value to the remote station, not a new image derived from the source image.

Consider exemplary independent claim 1, as amended, which recites in relevant part:

> "…selecting a region of the decompressed medical image at the second location; and
>
> applying image <u>analysis</u> operations to a region of the source medical image at the first location corresponding to the selected region of the decompressed medical image (emphasis added)."

Neither Wood nor Sivan, either alone or in combination, teach or suggest performing an image analysis operation on a region of a source medical image at one location corresponding to a region of a decompressed medical image selected at another, remote location. Accordingly, Applicant submits that claims 1-4, 6-11, 13-17, 19 and 20, as amended, are allowable.

Claims 5, 12, and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wood and Sivan as applied to claims 1, 10, and 15, and further in view of Nishikawa et al. (US 6,058,322, hereinafter "Nishikawa").

The action states that Nishikawa teaches image analysis operations that include outputting a score and communicating the score to the remote view station for display, citing the abstract, col. 31, ll. 5-15 and col. 33, ll. 3-12. Applicant can find no mention of transmitting any information over a network in those sections or in any part of the patent. Furthermore, Nishikawa does not disclose compressing the image to be analyzed. As described above, Sivan deals with image processing problems associated with converting between high resolution and low resolution images, not image analysis problems associated with compression. Since neither of Wood or Sivan discuss the problems associated with data losses due to compression in image analysis operations, Applicant submits that there is no motivation to combine these references. Accordingly, Applicant submits that claims 5, 12, and 18 are allowable.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Enclosed is a check for $55.00 for the Petition for Extension of Time fee.

Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 1/11/07

Scott C. Harris
Reg. No. 32,030

Fish & Richardson P.C.
PTO Customer No. 20985
4350 La Jolla Village Drive, Suite 500
San Diego, California 92122
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

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**Version with markings to show changes made**

In the claims:

Claims 27-30 have been cancelled.

Claims 1, 10, 15, 23, and 24 have been amended as follows:

1. (Twice Amended) A method comprising:

generating a compressed medical image from a source medical image at a first location;

transmitting the compressed medical image to a remote view station at a second location for display;

decompressing the compressed image file;

selecting a region of the [compressed] decompressed medical image at the second location; and

applying image analysis operations to a region of the source medical image at the first location corresponding to the selected region of the [compressed] decompressed medical image.

10. (Twice Amended) A system comprising:

an image server at a first location storing a source medical image;

a remote view station at a second location communicatively coupled to the image server to receive a compressed version of the source medical image, said remote view station comprising a decoder operative to decompress the compressed medical image,

wherein the remote view station includes an input device for selecting a region of the [compressed] decompressed medical image, and further wherein the image server applies an image analysis operation on a region of the source medical image that corresponds to the selected region of the [compressed] decompressed medical image.

15. (Twice Amended) A computer program, tangibly stored on a computer-readable medium, comprising instructions operable to cause a programmable processor to:

generate a compressed medical image from a source medical image at a first location;

transmit the compressed medical image to a remote view station at a second location for display;

receive at the first location region information from the remote view station, wherein the region information defines a region within a decompressed medical image generated from the compressed medical image; and

apply image analysis operations to a region of the source medical image at the first location as a function of the region information.

23. (Twice Amended) A method comprising:

compressing a source medical image at a first compression level at a first location;

transmitting the compressed medical image to a remote view station at a second location for display;

receiving at the first location region information separate from a decompressed [the compressed] medical image from the remote view station, said decompressed medical image generated from the compressed medical image at the remote view station, wherein the region information defines a region of the decompressed [compressed] medical image; and

compressing a region of the source medical image at a second compression level at the first location as a function of the region information, wherein the second compression level results in less information loss than the first compression level.

24. (Amended) The method of claim [22] 23 wherein transmitting the compressed medical image includes transmitting the compressed medical image over a global packet-switched network.